

Footnotes

Chapter 1

1. The early history of the Corps of Engineers is related in William H. Goetzmann, *Army Exploration in the American West, 1803-1863* (New Haven, 1959) and Forest G. Hill, *Roads, Rails and Waterways: The Army Engineers and Early Transportation* (Norman, 1957). See also Raymond H. Merritt, *Creativity, Conflict and Controversy: A History of the St. Paul District U.S. Army Corps of Engineers* (Washington, D.C., 1979), pp. 44-45.
2. For the Lewis and Clark expedition, see John Bakeless, *Lewis and Clark: Partners in Discovery* (New York, 1947); Reuben Gold Thwaites, *Journals of Lewis and Clark*, 8 vols. (New York, 1904-1905); quotation from Donald Jackson, ed., *Letters of the Lewis and Clark Expedition with related Documents, 1783-1854* (Urbana, 1962), p. 61.
3. For Bonneville see Washington Irving, *The Adventures of Captain Bonneville*, ed. Edgeley W. Todd (Norman, 1961); quote *ibid.*, p. 382.
4. Fremont's activities are treated by William H. Goetzmann, *Exploration and Empire: The Explorer and the Scientist in the Winning of the American West* (New York, 1966), pp. 233, 240-250; Allen Nevins, *Fremont, Pathmaker of the West* (New York, 1955); Donald Jackson and Mary Lee Spence, eds., *The Expeditions of John Charles Fremont*, 2 vols. (Urbana, 1970-73); and Frank N. Schubert, *Vanguard of Expansion: Army Engineers in the Trans-Mississippi West, 1819-1879* (Washington, D.C., 1980), pp. 19-36.
5. For an excellent biography of Benton, see William N. Chambers, *Old Bullion Benton, Senator from the New West* (Boston, 1956).
6. For a history of the sectional conflict and the coming of the Civil War, see David M. Potter, *The Impending Crisis, 1848-1861* (New York, 1976); the bearing of this conflict on Pacific Northwest history is treated by Dorothy O. Johansen and Charles M. Gates, *Empire of the Columbia: A History of the Pacific Northwest*, 2d ed. (New York, 1967); more specialized studies of pre-Civil War Pacific Northwest political and military history are James E. Hendrickson, *Joe Lane of Oregon: Machine Politics and the Sectional Crisis, 1849-1861* (New Haven, 1967) and Robert W. Johannsen, *Frontier Politics and the Sectional Conflict: The Pacific Northwest on the Eve of the Civil War* (Seattle, 1955).
7. The standard account of the military road construction activity of the Corps of Engineers and the Corps of Topographical Engineers in the Pacific Northwest is in W. Turrentine Jackson, *Wagon Roads West: A Study of Federal Road Surveys and Construction in the Trans-Mississippi West* (Berkeley and Los Angeles, 1952), pp. 71-106. For a description of fort construction, see Priscilla Knuth, "Picturesque" Frontier: The Army's Fort Dalles (Portland, 1967).
8. Quoted in Jackson, *Wagon Roads* p. 75.
9. Schubert, *Vanguard of Expansion*, p. 92; Derby to Hartman Bache, July 25, 1855, National Archives Record Group 77 (hereafter, NARG 77), Topographical Bureau, Letters Received.
10. Derby to Bache, Jan. 15, 1856, *ibid.*
11. Bache to Derby, Sept. 25, 1855, *ibid.*
12. Derby to Bache, Jan. 15, 1856, *ibid.*
13. Jackson, *Wagon Roads*, pp. 77-78; quoted in Fred Lockley, *History of the Columbia River Valley From The Dalles to the Sea* (Chicago, 1928), p. 241.
14. Derby to Bache, Oct. 10, 1855, NARG 77, Topographical Bureau, Letters Received.
15. Derby to Bache, July 12, 1856, *ibid.*
16. For a colorful and detailed description of Derby's experiences building the portage road, see his letters to Bache, Apr. 1-Oct. 10, 1856 inclusive, *ibid.*; Jackson, *Wagon Roads*, pp. 96-98.
17. Derby to Bache, Oct. 6, 1856, NARG 77, Topographical Bureau, Letters Received; Jackson, *Wagon Roads*, pp. 78-84, 101-106.
18. Jackson, *Wagon Roads*, pp. 84-88, provides a good account of this expedition. See also, Priscilla Knuth, "Images of the Deschutes Country," in *High and Mighty: Select Sketches about Deschutes County*, ed. Thomas Vaughan (Portland, 1981), pp. 147-187.
19. Quote in Jackson, *Wagon Roads*, p. 86.
20. U.S. Cong., *House Doc.*, No. 114, 35th Cong., 2d sess., quote p. 1.
21. NARG 77, Bulky File, Misc. See also Maj. Osborne Cross, "Report of Expedition from Fort Leavenworth to Fort Vancouver, 1850," U.S. Cong., *Senate Doc.*, No. 1, 31st Cong., 2d sess.; Lt. John Mullan, "Topographical Memoir of Col. Wrights Campaign, 1859," U.S. Cong., *Senate Doc.*, No. 32, 36th Cong., 2d sess.
22. Goetzmann, *Exploration and Empire*, pp. 262-295; Schubert, *Vanguard of Expansion*, pp. 95-113; Knuth, "Images," pp. 147-187.
23. U.S., Army, Corps of Engineers, *Annual Report of the Chief of Engineers 1867* (Washington, D.C., 1867), pp. 50-51 (hereafter, *ARCE*).
24. *ARCE 1867*, pp. 511-515, 327-332; *ARCE 1868*, pp. 872-873.
25. *ARCE 1869*, pp. 469-470, 478-479; *ARCE 1870*, pp. 508-509.
26. *ARCE 1870*, p. 509.

27. The Hudson's Bay Company sent the first steampowered vessel to Fort Vancouver in 1836. After operating the boat for a short time on the Columbia, the company transferred it to British Columbia. Early Oregon steamboat history is dealt with in Randall Mills, *Stern-Wheelers up Columbia: A Century of Steamboating in the Oregon Country* (Palo Alto, 1947); Howard M. Corning, *Willamette Landings: Ghost Towns of the River*, 2d. ed. (Portland, 1973); and Fritz Timmen, *Blow for the Landing* (Caldwell, Idaho, 1973).
28. *ARCE 1867*, pp. 509-511; quote, p. 511.
29. *ARCE 1868*, pp. 874, 877-883; *ARCE 1869*, pp. 471, 474-478.
30. *ARCE 1868*, p. 877.
31. *ARCE 1868*, p. 880.
32. *ARCE 1869*, pp. 474-477.
33. *ARCE 1873*, p. 1121; *ARCE 1874*, pt. 2, p. 358.
34. *ARCE 1868*, p. 873; *ARCE 1869*, pp. 469-470; *ARCE 1871*, pp. 905-909.
35. *ARCE 1871*, p. 906.
36. *ARCE 1871*, p. 909; see also *ibid.* p. 906.
37. Williamson to Chief of Engineers, Dec. 17, 1870, NARG 77, Records of the Chief of Engineers (hereafter, RCE), Letters Received; *ARCE 1871*, pp. 97, 902, 909-914.
38. For example, see *ARCE 1867*, p. 505.

Chapter 2

1. *ARCE 1871*, pp. 96, 898-899. The term "district" was not used in reference to Corps of Engineer Offices until 1893. In 1908, the Corps replaced its "engineer office" terminology with designated district names. Thus, the Portland Engineer Office officially became the Portland District Office. The two terms are used interchangeably in this study.
2. *ARCE 1871*, p. 899; CE to Robert, Mar. 22, May 24, June 20, 1871, NARG 77, RCE, Letters Sent.
3. Quote from Harvey W. Scott, ed., *History of Portland Oregon* (Syracuse, 1890), p. 158; *Daily Oregon Bulletin*, Apr. 18, 1871; Johansen, *Empire of the Columbia*, pp. 278-299.
4. *ARCE 1871*, p. 900; see also Ainsworth to Williamson, July 20, 1867, *ARCE 1867*, pp. 510-511.
5. *ARCE 1871*, p. 900.
6. *ARCE 1872*, p. 984.
7. U.S., *Statutes at Large*, v. 17, p. 565; *ARCE 1872*, pp. 982-984, 988, 992-996, *ARCE 1873*, pp. 1116-1117; *ARCE 1875*, p. 752.
8. *ARCE 1873*, pp. 1117-1118.
9. *ARCE 1872*, p. 990; see also, *ibid.*, 986, 988-992.
10. *ARCE 1872*, pp. 996-998; *ARCE 1873*, pp. 1121, 1123-1129; *ARCE 1874*, pp. 358, 364; U.S., *Statutes at Large*, v. 17, p. 566.
11. *ARCE 1872*, p. 998.
12. *ARCE 1876*, pt. 2, pp. 632-638; *ARCE 1875*, pt. 2, pp. 730-736, 760-770, 772-787; *ARCE 1874*, pt. 2, pp. 351-353, 355-362; CE to Sen. Mitchell, Sept. 25, 1875, NARG 77, RCE, Letters sent.
13. *ARCE 1875*, pt. 2, p. 781, see also pp. 781-787.
14. *ARCE 1875*, pt. 2, pp. 741-751, 791-800; *ARCE 1876*, pt. 2, pp. 639-645; *ARCE 1874*, pt. 2, pp. 364-368; U.S., *Statutes at Large*, v. 18, p. 242.
15. Thwaites, ed., *Journals of Lewis and Clark*, 3:180.
16. *ARCE 1875*, pt. 2, pp. 787-791, quote p. 787.
17. *ARCE 1874*, pt. 2, pp. 352-353; *ARCE 1875*, pt. 2, pp. 732-737.
18. *ARCE 1874*, pt. 2, pp. 360-361.
19. *ARCE 1875*, pt. 2, pp. 786-787.
20. Mills, *Stern-Wheelers*, pp. 132-134.
21. *ARCE 1876*, pt. 2, p. 653. *ARCE 1877*, pt. 2, pp. 1005-1006.
22. *ARCE 1876*, pt. 2, p. 646.
23. *ARCE 1876*, pt. 2, pp. 646-649.
24. *ARCE 1876*, pt. 2, pp. 649-650; *ARCE 1877*, pp. 1002-1003.
25. *ARCE 1877*, pp. 1020-1021, 1025; CE to Wilson, Mar 8, 1877, NARG 77, RCE, Letters Sent.
26. *ARCE 1927*, p. 1671.
27. *ARCE 1877*, pp. 1021-1024; *ARCE 1880*, p. 2254; *ARCE 1882*, p. 2644; *ARCE 1883*, pp. 2000-2002, 2007.
28. *ARCE 1877*, p. 1024.
29. *ARCE 1877*, p. 1025; *ARCE 1889*, pp. 2573-2574.
30. *ARCE 1876*, pt. 2, pp. 669-672.
31. *ARCE 1876*, pt. 2, p. 662.
32. *ARCE 1876*, pt. 2, p. 665; Wilson to CE, Dec. 17, 1876, Portland District Civil Files, Oregon Historical Society Microfilm, Reel 325 (hereafter, PDCF, OHS).
33. *ARCE 1877*, pp. 1036-1044; *ARCE 1878*, pp. 1330-1332.
34. *ARCE 1876*, pt. 2, p. 663.
35. *ARCE 1876*, pt. 2, pp. 654-661; *ARCE 1877*, pp. 1026-1036; *ARCE 1878*, pp. 1325-1330; *ARCE 1879*, pp. 1788-1789.
36. *ARCE 1878*, p. 1329.
37. *ARCE 1879*, p. 1813; U.S., *Statutes at Large*, v. 20, p. 161.
38. *ARCE 1879*, p. 1814.
39. *ARCE 1879*, pp. 1814-1817; *ARCE 1884*, p. 2279.
40. *ARCE 1879*, pp. 1863-1875, 1806-1810, 1791-1796; U.S. *Statutes at Large*, v. 20, pp. 157, 160, 162; CE to Wilson, Mar. 16, 1878, NARG 77, RCE, Letters sent; CE to Sen Mitchell, Apr 2, 1878, *ibid.*; CE to Sec. of War, Apr. 5, 1878, *ibid.*

41. *ARCE* 1879, pp. 1823-1824; U.S., *Statutes at Large*, v. 20, p. 162.
42. Wilson to John Wilson, Feb. 8, 1877, PDCF, OHS Microfilm, Reel 325; Wilson to Thomas Robinson, Feb. 9, 1877, *ibid.*; Wilson to CE, Feb. 10, 1877, *ibid.*; CE to Wilson, Feb. 27, 1877, *ibid.*, Reel 60.

Chapter 3

1. *ARCE* 1876, pt. 2, pp. 666-667.
2. Mills, *Stern-Wheelers*, pp. 67-69; Stewart H. Holbrook, *The Columbia* (New York, 1956), pp. 102-125.
3. Dorothy O. Johansen, "The Oregon Steam Navigation Company: An Example of Capitalism on the Frontier," *Pacific Historical Review*, 10 (1941), pp. 179-188; Mills, *Stern-Wheelers*, pp. 64-79.
4. *ARCE* 1878, pp. 1343, quote, 1344.
5. *ARCE* 1876, pt. 2, p. 667; Wilson to CE, Apr. 8, 1876, PDCF, OHS Microfilm, Reel 325; Wilson to Bolton, Oct 24, 1876, *ibid.*; Gen. R. S. Alexander to Wilson, Sept. 22, 1876, PDCF, OHS Microfilm, Reel 60; Bolton to Wilson, Sept 14, 1876, *ibid.*
6. Wilson to CE, Sept. 5, 1876 and Feb. 5, 1877, PDCF, OHS Microfilm, Reel 60; CE to Sen. Mitchell, Feb 23, 1877, NARG 77, RCE, Letters Sent; *ARCE* 1877, pp. 1046-1049; *ARCE* 1878, pp. 1333-1339, 1340-1344.
7. *ARCE* 1878, pp. 1334, 1336-1337; CE to Wilson, Nov. 28, 1877, NARG 77, RCE, Letters sent.
8. *ARCE* 1878, pp. 1335-1336; *ARCE* 1879, pp. 1790-1791; CE to Wilson Oct. 17, 1877, NARG 77, RCE, Letters sent; Wilson to CE, Aug. 5 - Oct. 31, 1878, NARG 77, RCE, Land Papers, Box 53.
9. The correspondence and records covering the first year of work on the Cascade Canal are voluminous. See esp. *ARCE* 1879, pp. 1790, 1843-1852; Capt. Charles Powell, "Report on the Cascades Canal," June 14, 1884, NARG 77, RCE, Bulky File; Gillespie to CE, Jan. 31, Apr. 28, 1879, PDCF, OHS Microfilm, Reel 326; CE to Gillespie, Mar. 14, Nov. 12, 14, 20, 1879, NARG 77, RCE, Letters Sent; Gillespie to C. P. Skinner, Mar 27, Nov. 10, 14, 18, 20, 28, 1879, PDCF, OHS Microfilm, Reel 326; Bolton to Gillespie, Feb. 6, 1879, *ibid.*, Reel 236.
10. CE to Sec. of War, Feb. 11, 1880, Jun. 28, 1884, NARG 77, RCE, Letters Sent; CE to T. C. Platt, July 3, 1884, *ibid.*
11. *ARCE* 1879, pp. 1843-1850; *ARCE* 1880, pp. 2298-2314, quote, p. 2307.
12. *ARCE* 1881, pp. 2563-2582; *ARCE* 1888, pp. 2170-2174; *ARCE* 1889, pp. 2557-2559; *ARCE* 1891, pp. 3328-3361.
13. *ARCE* 1883, pp. 2043-2046; *ARCE* 1885, pp. 2428-2437; *ARCE* 1886, pp. 1944-1945; *ARCE* 1887, pp. 2476-2485; *ARCE* 1888, pp. 2161-2164; *ARCE* 1889, pp. 2551-2559; *ARCE* 1892, pp. 2821-2822; *ARCE* 1895, pp. 3568-3589; *ARCE* 1897, p. 3419.
14. *ARCE* 1887, p. 2478.
15. *Oregonian*, Jan. 28, 1891; *The Times-Mountaineer*, Jan. 17, 1891; *The Dalles Daily Chronicle*, Jan. 1891; "Official Proceedings of the Columbia Waterway Convention," Dec. 2, 1885, NARG 77, RCE, Bulky File; Speeches of Hon. John Mitchell, Jul. 10, 1886, NARG 77, RCE, Bulky File 3272/B.
16. *ARCE* 1888, p. 2163.
17. U.S. Cong., *Senate Doc.*, No. 72, 51st Cong., 2d sess., p. 31. Rep. B. Hermann to CE, Jan. 22, 1891, NARG 77, RCE, Letters Rec. Handbury wrote privately to his division engineer that in Herman's charges "I can clearly see the hand of the politician who hopes through a contract system to run the work in the interests of his faction." Feb. 11, 1891, PDCF, OHS Microfilm, Reel 237. For criticism of the Corps, see newspapers cited in note 15 above.
18. *ARCE* 1893, pp. 3501-3511; *ARCE* 1894, pp. 2646-2653; quote from Handbury to Col. Poe, Sep. 23, 1892, PDCF, OHS Microfilm, Reel 238; see also Lieut. Taylor to Capt. Marshall, Sep. 9, 1892, *ibid.*
19. *ARCE* 1895, pp. 3568-3589; *ARCE* 1896, pp. 3267-3281; *ARCE* 1897, pp. 3416-3423; *ARCE* 1900, pp. 4324-4325; *ARCE* 1915, pp. 1510-1511; U.S. Cong., *Senate Doc.*, No. 26, 53d Cong., 3d sess.
20. *ARCE* 1897, p. 3418; Mills, *Stern-Wheelers*, pp. 143-144.
21. *ARCE* 1895, p. 3577. For the engineering importance of the Cascade Canal, see Capt. Harry Taylor to CE, Apr. 16, 1902, NARG 77, RCE, Gen. Corresp.
22. *ARCE* 1880, p. 2277.
23. *ARCE* 1879, pp. 1788-1789, 1831-1838; *ARCE* 1880, pp. 2275-2289; *ARCE* 1882, pp. 2654-2656; U.S., *Statutes at Large*, v. 20, p. 157.
24. *ARCE* 1879, pp. 1793-1795; *ARCE* 1880, p. 250, pp. 2323-2324.
25. *ARCE* 1880, pp. 2324-2326; *ARCE* 1881, p. 2583.
26. *ARCE* 1881, p. 2585.
27. *ARCE* 1881, p. 2584; *ARCE* 1884, pp. 2260-2261; *ARCE* 1879, p. 1794; *ARCE* 1890, pp. 2935.
28. *ARCE* 1879, p. 1809.
29. *ARCE* 1879, p. 1807.
30. *ARCE* 1879, pp. 1808-1809.
31. *ARCE* 1881, pp. 2596-2599; *ARCE* 1888, p. 2138; Gillespie to Littlefield, Apr. 22, 1881, PDCF, OHS Microfilm, Reel 328; Gillespie to Littlefield, June 14, 1881, *ibid.*, Reel 329; Powell to T.W. Bennett, Apr. 3, 1883, *ibid.*, Reel 332; U.S., *Statutes at Large*, v. 21, p. 193.
32. Gillespie to Capt. Adams, June 28, 1880, PDCF, OHS Microfilm, Reel 327; Gillespie to Polhemus, Jul. 13, 1880, *ibid.*, Reel 327; Gillespie to CE, Jul. 27, 1880, *ibid.*, Reel 61; Lynn Alperin, *Custodian of the Coast: History of the United States Army Engineers at Galveston* (Washington, D.C., 1977), p. 153; *ARCE* 1881, p. 2590, quote, p. 2592.
33. *ARCE* 1881, pp. 2590-2591, 2593.
34. *ARCE* 1881, p. 2591; Gillespie to Polhemus, Jun. 18, 25, 1881, PDCF, OHS Microfilm, Reel 329.
35. *ARCE* 1881, pp. 2591-2592.
36. *ARCE* 1889, pp. 2514, 2517-2521.
37. *ARCE* 1875, pp. 748-749.
38. *ARCE* 1877, p. 1003. He expressed the same opinion one year later: *ARCE* 1878, p. 1321.
39. *ARCE* 1880, p. 2315.
40. *ibid.*, p. 2321. For the preliminary surveys, see *ARCE* 1879, pp. 1791, 1853, 1863-1875; *ARCE* 1880, pp. 2315-2318, 2321-2323.

41. *ARCE* 1879, p. 1853.
42. *ARCE* 1880, p. 2319.
43. *ARCE* 1880, pp. 2318-2321; quote on p. 2321.
44. *ARCE* 1881, pp. 2546-2548.
45. *ARCE* 1881, pp. 2534-2535, 2548-2552; *ARCE* 1883, pp. 2010-2021.

Chapter 4

1. The following discussion on the distribution of work within the Portland District is based on the *ARCE* 1884-1898, *passim*.
2. The following account of Corps and Portland District organization and operations is based on a close reading of correspondence in Portland District Civil Files on microfilm at the Oregon Historical Society and the published histories of other Corps districts. See, for instance, Merritt, *Creativity, Conflict and Controversy*, pp. 38-57.
3. CE to Gillespie, May 21, 1879, PDCF, OHS Microfilm, Reel 61.
4. Gillespie to CE, Jan. 27, Feb. 1881, PDCF, OHS Microfilm, Reel 328; CE to Gillespie, Feb. 9, 1881, *ibid.*, Reel 61.
5. Orders, Feb. 23, 1877, PDCF, OHS Microfilm, Reel 325.
6. Powell to CE, Dec. 26, 1882, PDCF, OHS Microfilm, Reel 332. A few months later Powell instructed Asst. Eng. Littlefield to "please be very careful to carry out my directions about employing or engaging in the work in any way only men of steady habits and good character." Feb. 4, 1883, *ibid.*, Reel 333. See also Powell to Habersham, Dec. 1, 6, 10, 11, 15, 1884, *ibid.*, Reel 338.
7. Gillespie to C.M. Bolton, Jan. 23, 1879, PDCF, OHS Microfilm, Reel 326.
8. All of the correspondence relating to this affair is in U.S. Cong., *Senate Doc.*, No. 12, 49th Cong., 2d sess.
9. At the time the transfer was made, Captain Powell indicated to his subordinate that he did not understand the reason for it. Powell to Lt. Young, Oct. 6, 1886, PDCF, OHS Microfilm, Reel 343.
10. Merritt, *Creativity, Conflict and Controversy*, p. 236, 437.
11. *ARCE* 1880, p. 2331.
12. *ARCE* 1881, p. 2600; U.S., *Statutes at Large*, v. 20, p. 191.
13. *ARCE* 1880, p. 2332; *ARCE* 1889, p. 2589; *ARCE* 1914, p. 1412; U.S., *Statutes at Large*, v. 36, p. 665; U.S. Cong., *House Doc.*, No. 1167, 60th Cong., 2d Sess.
14. *ARCE* 1881, pp. 2612, 2604, 2608-2611, 2614-2616, 2615; *ARCE* 1882, pp. 2685-2686; *ARCE* 1884, p. 2274.
15. *ARCE* 1882, pp. 2687-2688, 2722-2724; *ARCE* 1897, pp. 3474-3478; *ARCE* 1899, pp. 3248-3249; *ARCE* 1913, pp. 1364-1365; *ARCE* 1914, p. 1412; U.S., *Statutes at Large*, v. 30, p. 1149; *ibid.*, v. 37, pt. 1, p. 820; U.S. Cong., *House Doc.*, No. 28, 62d Cong., 1st sess.; *ARCE* 1913, pp. 1364-1365; *ARCE* 1928, pp. 1761-1763.
16. Thomas W. Symons, *The Upper Columbia River and the Great Plains of the Columbia*, printed in U.S. Cong., *Senate Doc.*, No. 186, 47th Cong., 1st sess., pp. 2-3; *ARCE* 1882, pp. 2851-2855.
17. Symons, *Upper Columbia River*, pp. 112.
18. *ARCE* 1879, pp. 2192-2201; *ARCE* 1882, pp. 2716-2722.
19. Quote, *ARCE* 1897, p. 3457; *ARCE* 1893, pp. 3376-3377.
20. *ARCE* 1904, pp. 3469-3472; *ARCE* 1905, p. 2455; *ARCE* 1906, pp. 1985-1989; *ARCE* 1907, pp. 759-761; *ARCE* 1918, p. 1751-1757; U.S., *Statutes at Large*, v. 34, pp. 1107-1108.
21. CE to Maj. Williamson, Aug. 22, 1870, NARG 77, RCE, Letters Sent; Williamson to CE, Dec. 17, 1870, *ibid.*, Letters Rec.
22. The following account of the Willamette River Bridge Controversy is based on documents in U.S. Cong., *Senate Doc.*, No. 162, 47th Cong., 1st sess.; CE to Sec. of War, July 3, 1883, NARG 77, RCE, Letters Sent.
23. *ARCE* 1882, p. 2657; *ARCE* 1883, pp. 2003-2004; *ARCE* 1884, pp. 2219-2220; *ARCE* 1885, p. 2380; *ARCE* 1887, pp. 2661-2671; *ARCE* 1888, pp. 2685-2686.
24. *ARCE* 1892, pp. 409; U.S. Cong., *Senate Doc.*, No. 118, 52d Cong., 1st sess.
25. *ARCE* 1882, pp. 2648; *ARCE* 1883, pp. 2019-2020; *ARCE* 1888, pp. 2590-2596; 2684-2685; U.S. Cong., *Senate Doc.*, No. 105, 49th Cong., 1st sess.; Powell to CE, Nov. 10, Dec. 12, 1884, PDCF, OHS Microfilm, Reel 338; CE to Sen. Mitchell, Aug., 22, 1889, NARG 77, RCE, Gen. Corresp.; Handbury to CE, Mar. 16, Sept. 8, 1891, Apr. 14, 1892, *ibid.*; Post to CE, Aug. 15, Sept. 8, 1894, Mar. 4, 1895, *ibid.*; Albert E. Cowdrey, "Pioneering Environmental Law: The Army Corps of Engineers and the Refuse Act," *Pacific Historical Review*, XLVI (Aug. 1975), pp. 331-349.
26. *ARCE* 1885, p. 2378; *ARCE* 1889, pp. 2577-2578; *ARCE* 1893, pp. 3523-3524.
27. *ARCE* 1897, p. 3430; *ARCE* 1898, pp. 3029-3030 contains excellent description of the pile and brush dams. U.S., *Statutes at Large*, v. 29, p. 233.
28. *ARCE* 1904, pp. 3529-3532; *ARCE* 1912, p. 1208; *ARCE* 1930, p. 1861.
29. *ARCE* 1898, pp. 3026-3027; *ARCE* 1893, pp. 3531-3533; *ARCE* 1895, pp. 3602-3605; *ARCE* 1901, pp. 3552, 3556.
30. *ARCE* 1900, pp. 4368-4415; *ARCE* 1915, p. 3396.
31. *ARCE* 1921, pp. 1885-1886.
32. U.S., *Statutes at Large*, v. 52, p. 1222; U.S., *Statutes at Large* v. 59, pt. 1, p. 21; U.S. Cong., *House Doc.*, No. 544, 75th Cong., 3d sess.; Portland District, Report of Commerce for Willamette, Columbia and Snake Rivers (Portland, 1980)

Chapter 5

1. *ARCE* 1882, p. 2651; *ARCE* 1883, p. 2003.
2. *ARCE* 1882, pp. 2690-2716; *ARCE* 1885, pp. 2409-2413; *ARCE* 1883, pp. 1998-2008, 2038-2055; *ARCE* 1884, pp. 2215-2219, 2226-2259; *ARCE* 1885, pp. 2375-2380.
3. *ARCE* 1882, p. 2647.
4. *ARCE* 1884, p. 2223; Powell to Senator Dolph, Jan. 29, 1884, PDCF, OHS Microfilm, Reel 335.
5. *ARCE* 1885, p. 2383. For report of the Board, see *ARCE* 1883, pp. 2011-2037.

6. *ARCE* 1883, p. 2017.
7. *ARCE* 1885, pp. 2375, 2423.
8. *ARCE* 1885, pp. 2382-2384; *ARCE* 1886, p. 1976; *ARCE* 1888, p. 2158.
9. Descriptions of construction techniques and of specially designed equipment are contained in *ARCE* 1886, pp. 1972-1976, 1980-1983; *ARCE* 1889, pp. 2532-2533, 2539; *ARCE* 1890, p. 3013.
10. *ARCE* 1891, p. 3320.
11. *ARCE* 1893, p. 3502.
12. *ARCE* 1896, pp. 3251-3257.
13. *ARCE* 1900, pp. 4430-4453; *ARCE* 1903, pp. 2275-2305.
14. *ARCE* 1906, p. 758.
15. *ARCE* 1914, pp. 1404-1405, 3231.
16. *ARCE* 1917, p. 1717. Asst. Eng. Gerald Bagnall discussed various aspects of the jetty construction in "Improvement of the Mouth of the Columbia River," *Professional Memoirs*, VIII (Nov.-Dec, 1916), pp. 687-720.
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14. U.S. Cong., *House Doc.*, No. 403, 87th Cong., 2d sess.; Portland District, *Cascadia Reservoir Design Memorandum No. 1, Site Selection Supplement No. 1* (Portland, 1970); North Pacific Division, *Water Resources Development*, p. 37; Eugene, Or. *Register-Guard*, July 27, Nov. 18, 1971, Apr. 5, 1972; Sen. Packwood, *Cascadia Dam: Environmental and Economic Considerations* (n.d.).
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27. Portland District, *Postflood Report, November-December 1977 Floods* (Portland, 1978), pp. A7-A17.
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30. Portland District, *Portland-Vancouver Metropolitan Area Water Resources Study: Plan of Study* (Portland 1976), p. 1.
31. *Ibid.*, pp. 1-2, 8-31; *ibid.* *Main Report* (Portland, 1979); *ibid.* *Summary* (Portland 1979); North Pacific Division, *Water Resources Development*, p. 38.
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34. *Framework Study, Appendix X: Navigation*; *Ibid.*, *Appendix VII: Flood Control*, pp. 1, 3-45.
35. *Framework Study, Appendix I: History*, pp. 21-28; North Pacific Division, *Water Resources Development*, pp. 87-88.
36. North Pacific Division, *Water Resources Development*, p. 88; Col. A. R. Marshall to DE, Sept. 20, 26, 1973, PDRHC, Columbia River, File No. 1518-01.
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